

## **REMARKS**

Applicants have been amended the claims in order to more particularly define the invention taking into consideration the outstanding Official Action. These amendments do not introduce new matter into the application.

In particular, claims 1, 9, and 16 have each been amended to recite first and second gain amplifiers and first through seventh switches for coupling of the DAC signal, ground signal, and respective outputs and inputs of the operational and gain amplifiers, as illustrated in Fig. 5. The first and second gain amplifiers correspond to gain amplifiers 202 and 203, described on page 5, lines 21-24 of the original specification. The first through seventh switches correspond to switches 211-217 described on page 6, line 3 to page 7, line 14 of the original specification.

In addition, claim 7 has been amended for consistency with claim 1, and dependency errors in claims 13, 14, 16, 17, 20, and 21 have been amended to correct dependency errors.

Because of each of the elements added to the claims is illustrated in the original drawings and described on pages 5-7 of the specification as originally filed, the amendments do not involve "new matter."

Reconsideration of this application is respectfully requested in view of the foregoing amendments and the following remarks.

## **I    Response to Rejections Under 35 U.S.C. § 102**

The rejection of claims 9-14, 16 and 22 is under 35 U.S.C. § 102(e) as being anticipated by Ishiwata et al. (U.S. Patent No. 6,792,013) hereinafter referred to as Ishiwata is respectfully traversed on the grounds that the Ishiwata patent fails to disclose or suggest the claimed switches, which enable the operational amplifier to charge the write-control signal with a virtual grounding effect when in a long-term mode, and to also provide a short-term mode (in which the operation amplifier operates as a voltage follower for initializing the write-control signal) and a closed-loop mode in which the charged write-control signal records data on a CD, as recited in claims 9 and 15 (it is noted that claim 16 listed in the rejection depends from claim 15).

Instead, Ishiwata uses a virtual ground solely for initialization, while write-control signal charging is carried out by using a D/A converter 8 to supply a set voltage data WRPOW and driving the terminal WLD by the operational amplifier 4 to follow the voltage based on the data WRPOW (see, col. 8, line 1-19, Fig. 3, and Fig. 4 of the Ishiwata patent). This is not analogous to the long-term mode of the claimed invention, in which the operational amplifier 201 *charges* (as opposed to initializing) the write-control signal by virtual ground, eliminating the need for an expensive D/A converter and provide

a substantially simpler and more compact write-control signal charging arrangement. Accordingly, in terms of the hardware structure, the invention is different from the cited reference and the die size of the invention is much smaller than the die size of Ishiwata, resulting in more efficient operation and lower cost.

Because the Ishiwata patent does not all elements of the claimed invention, withdrawal of the rejection of claims 9-14, 16 and 22 under 35 USC § 102(e) is respectfully requested.

## **II Response to Rejections Under 35 U.S.C. § 103**

Claims 20-21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishiwata et al. (U.S. Patent No. 6,792,013) in view of Inaba et al. (U.S. Patent No. 5,477,557). Claims 1-2, 5, 8, 15 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishiwata et al. (U.S. Patent No. 6,792,013) in view of Dosho et al. (U.S. Patent No. 5,822,236). Claims 6-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishiwata et al. (U.S. Patent No. 6,792,013) in view of Dosho et al. (U.S. Patent No. 5,822,236) as applied to claims 1-5, 5, 15-19 and 22 above, and further in view of Inaba et al. (U.S. Patent No. 5,477,557).

These rejections are respectfully traversed on the grounds that none of the applied references discloses or suggest modification of the arrangement of Ishiwata, which uses a virtual ground for initialization, to obtain the claimed arrangement of gain amplifiers and switches that permit charging of the write-control signal by virtual

ground (with a voltage follower for initialization) . The Dosho patent does not provide for any sort of control mechanism for a write-control signal employed to record data on a CD while the Inaba patent is directed to a laser drive circuit with maximum and minimum error detection, and therefore neither patent could have suggest modification of the Ishiwata patent to obtain the claimed invention.

The invention provides an apparatus and method for controlling a data write operation in an optical storage system comprising an operational amplifier 201 having a positive input end, a negative input end and an output end for outputting a write-control signal at the output end, the operational amplifier 201 being operated in one of a short-term mode, a long-term mode and a closed-loop mode, and the first-seventh switches for providing the short-term mode, the long-term mode, and the closed-loop mode. In the short-term mode, the operational amplifier is formed as a voltage follower for initializing the write-control signal; in the long-term mode, the operational amplifier charges the write-control signal with the virtual grounded effect, and in the closed-loop mode, the charged write-control signal is employed to record data on a CD.

Neither the Ishiwata patent nor the Dosho patent discloses or suggests providing an operational amplifier , as claimed, so that the operational amplifier 201 is formed as a voltage follower for initializing the write-control signal, and the operational amplifier 201 is used to charge the write-control signal with the virtual grounded

effect. Instead, the Ishiwata teaches using the virtual ground for initialization, and does not disclose or suggest forming the operational amplifier as a voltage follower for initializing the write-control signal in the short-term mode. Dosho, on the other hand, does not provide for any sort of control mechanism for a write-control signal which is employed to record data on a CD.

It is respectfully submitted that that neither Ishiwata, nor Dosho or Inaba, nor any reasonable combination thereof, discloses or suggests each and every element set forth in claim 1 of the present application, because neither Ishiwata nor Dosho discloses or suggests the manner in which the short-term mode, the long-term mode, and the closed-loop mode are carried out, much less by using first through seventh switches as now claimed.

The Examiner is correct that Ishiwata discloses using the virtual grounded effect for initializing the write-control signal. However, the claimed invention uses the virtual grounded effect for charging the write-control signal and a voltage follower for initializing the write-control signal, which is contrary to the arrangement of Ishiwata. This can be understood from the fact that, as shown in Fig. 4 of Ishiwata, the switch states are such that, in the initiation mode, the positive terminal is set to ground, and the negative terminal is set to open, which causes the voltage of negative terminal equal to 0V ( $V^- = V^+ = 0V$ ), so that Ishiwata uses the virtual ground effect to initialize the write-control signal rather than to drive the write-control signal.

In the Ishiwata patent, the D/A converter 8 is used to supply the set voltage data WRPOW and the terminal WLD is driven by the operational amplifier 4 to follow the voltage based on the data WRPOW (col. 8 line 1-19, fig. 3 and fig. 4) whereas, in the invention, the operational amplifier 201 is formed as a voltage follower for initializing the write-control signal and is used to charge the write-control signal by utilizing the virtual ground effect. With the virtual ground effect, the invention only uses the amplifier 201 to initialize and charge the write-control signal rather than an expensive D/A converter to supply the set voltage data WRPOW for charging the write-control signal.

As such, not only is the hardware structure of the invention different from the cited reference, but the effect of virtual grounding of the invention is also different from that of the cited reference. Thus, applicant respectfully submits that it would have been non-obvious to those persons of ordinary skill in the art to combine the teachings of Ishiwata, Dosho, and Inaba. Claims 1-22 should be allowed and the rejections under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,792,013 by Ishiwata in view of U.S. Patent 5,822,236 by Dosho, and further in view of U.S. Patent 5,477,557 by Inaba should be withdrawn.

### **CONCLUSION**

In view of the foregoing remarks, reconsideration and allowance of the application are now believed to be in order, and such action is hereby solicited. If any points remain in issue that the Examiner

feels may be best resolved through a personal or telephone interview,  
the Examiner is kindly requested to contact the undersigned attorney  
at the telephone number listed below.

Respectfully submitted,  
BACON & THOMAS, PLLC

A handwritten signature in black ink, appearing to read 'B. Urcia', with a long horizontal flourish extending to the right.

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